

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 55520
CSAH NO. 12
OVER THE
ZUMBRO RIVER
DISTRICT 6 - OLMSTEAD COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221 (CEI 151)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 55520, Piers 1, 2, and 3, were found to be in good condition with no defects of structural significance observed. The channel bottom, consisting of very firm material around Pier 1 and fine silty organic material around Piers 2 and 3, appeared stable with no significant changes since the previous inspection.

INSPECTION FINDINGS:

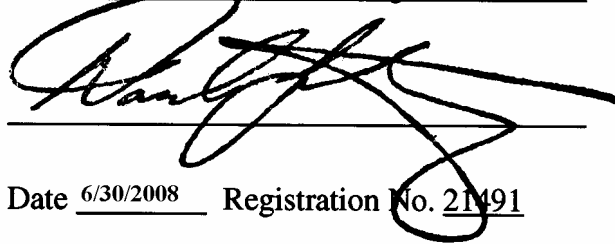
- (A) Footing exposure was observed around the entire perimeter of Pier 1 with a maximum vertical exposure of 1 foot along the downstream end and the east side of the pier.
- (B) The upstream nose of Pier 2 stops at 7 feet below the waterline and then cuts back 1.5 feet. Timber debris has accumulated in this area extending from channel bottom up 4 feet. There was also one tree trunk along east side of pier extending from channel bottom to 2 feet above the waterline.
- (C) A scour depression, 3 feet in radius and 1 foot deep, was observed at the upstream end of Pier 3.
- (D) Minor areas of poor consolidation were observed at various locations along the piers with typical diameters of up to 1 inch and typical penetrations of 1/2 inch.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 55520

Feature Crossed: Zumbro River

Feature Carried: CSAH No. 12

Location: District 6 - Olmstead County

Bridge Description: The superstructure consists of a four span, multiple steel girder bridge. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The pier footings are supported on steel piles. The piers are numbered 1 through 3 starting at the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 24, 2007

Weather Conditions: Sunny, 58°F

Underwater Visibility: 1.0 foot

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3

General Shape: The piers consist of a rectangular concrete shaft with rounded ends, supported by a rectangular footing founded on steel piles.

Maximum Water Depth at Substructure Inspected: Approximately 15.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the webwall at Pier 2.

Water Surface: The waterline was approximately 14.5 feet below reference.
Waterline Elevation = 915.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code I/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No



Photograph 1. Overall View of the Structure, Looking North.



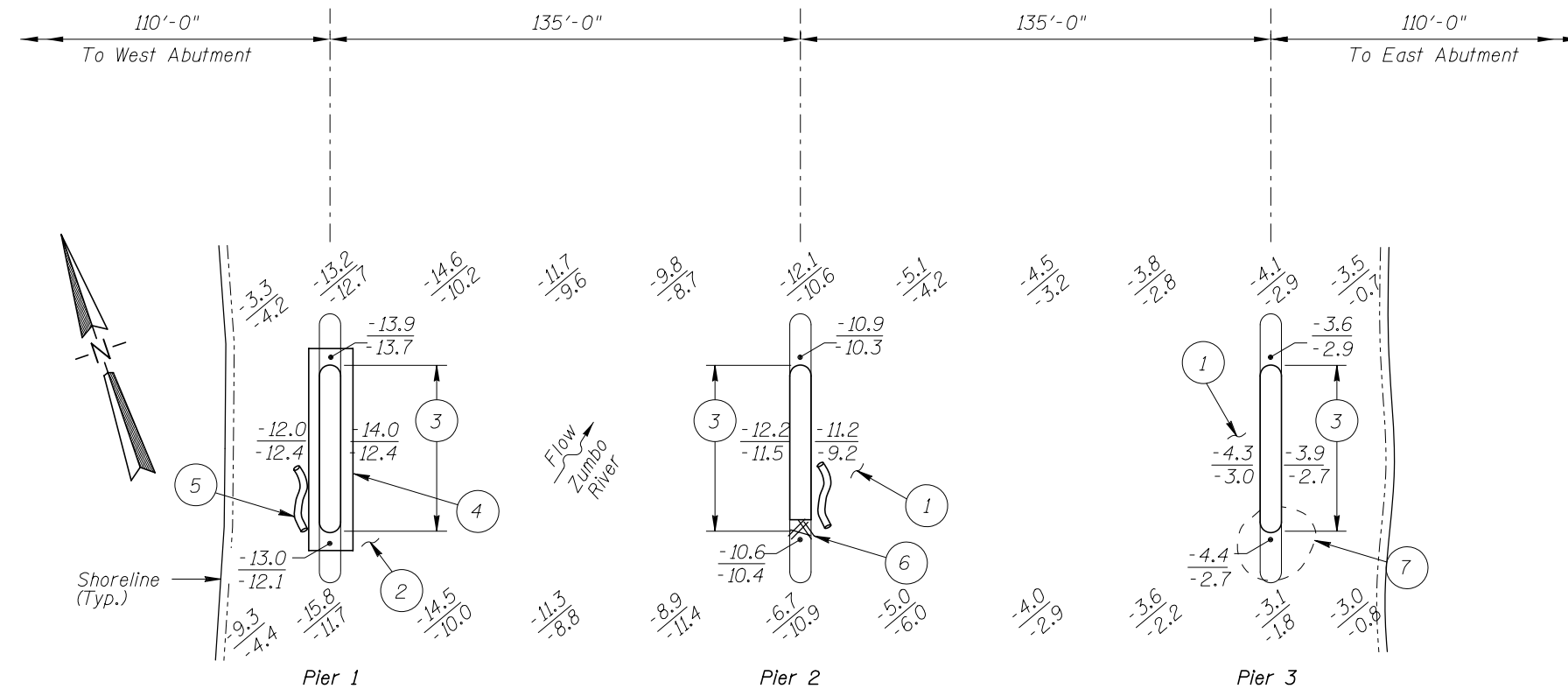
Photograph 2. View of Pier 1, Looking North.



Photograph 3. View of Pier 2, Looking North.



Photograph 4. View of Pier 3, Looking East.

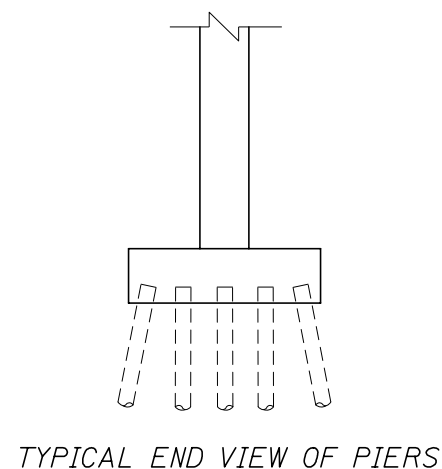


GENERAL NOTES:

- Piers 1, 2, and 3 were inspected underwater.
- At the time of inspection on October 29, 2007, the waterline was located approximately 14.5 feet below the top of the webwall of Pier 2. This corresponds with a waterline elevation of 915.5 based on the previous report dated October 2, 2002.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom consisted of fine silty organics with greater than 2 feet of probe rod penetration.
- The channel bottom consisted of firm material with no appreciable probe rod penetration around Pier 1.
- Minor voids due to poor consolidation of the concrete were observed at various locations along piers, typically up to 1 inch in diameter with up to 1/2 inch of penetration.
- Footing exposure at Pier 1 was observed all around the pier with a maximum vertical exposure of 1 foot along the downstream end and east side of the pier. The surface of the footing was rough with 1 inch irregularities. At the location where the shaft meets the column, voided areas with penetrations of 1 to 2 inches and 2 to 3 inches high were observed. There was a 3 to 4 feet area where the footing was not exposed due to infilling at the west face.
- A tree trunk 1 foot diameter was observed along the shore side of Pier 1 on top of the footing extending from the upstream nose to shaft midpoint.
- The upstream nose of Pier 2 stops at 7 feet below water and cuts back 1.5 feet. Debris has accumulated in this area from channel bottom up 4 feet, consisting of logs and branches 1.5 feet diameter and smaller. A tree trunk was observed from channel bottom to 2 feet above water along the east face of pier.
- A scour depression 3 feet radius and 1 foot deep was observed at the upstream end of Pier 3.

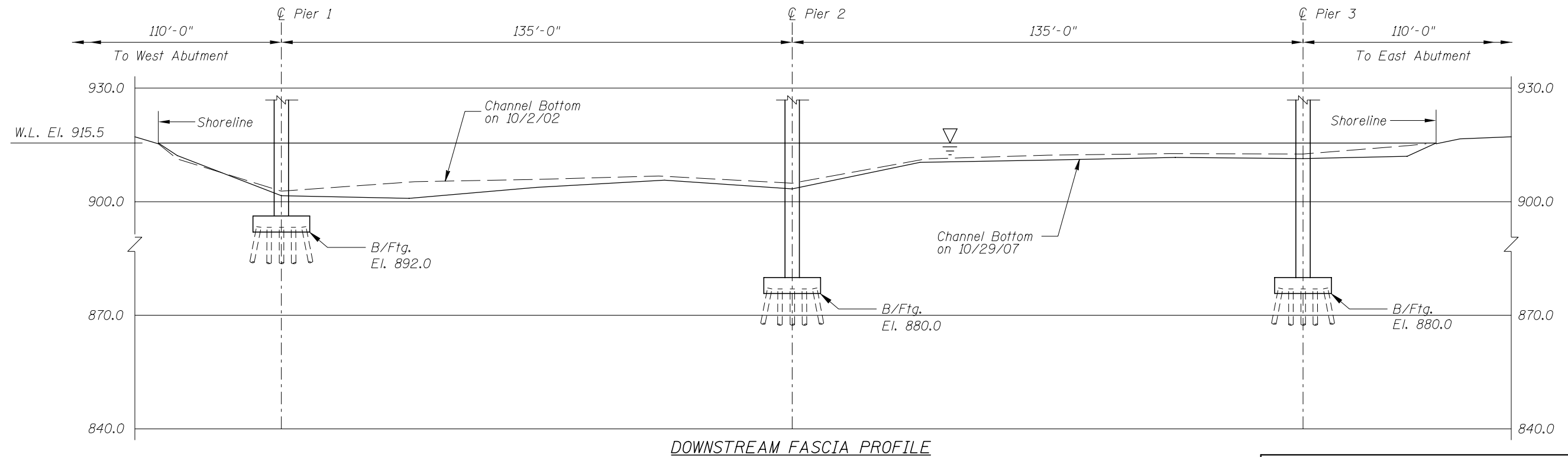
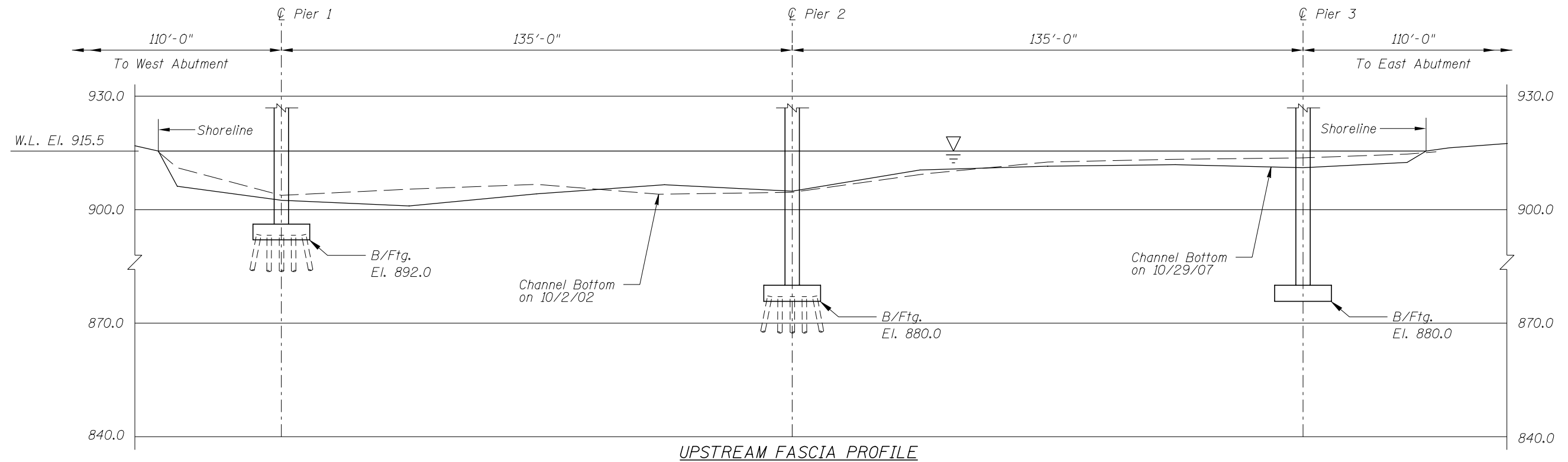


MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 55520
OVER THE ZUMBRO RIVER
DISTRICT 6, OLMTED COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: LJ	COLLINS ENGINEERS	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT, 2007
Checked By: DGS			Scale: NTS
Code: 52210151			Figure No.: 1



Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 55520 OVER THE ZUMBRO RIVER DISTRICT 6, OLMTSTED COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: LJ	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT, 2007
Checked By: DGS		Scale: 1"=30'
Code: 52210151		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 24, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 55520 WEATHER: Sunny, 58°F

WATERWAY CROSSED: Zumbro River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, U/W light, Scraper, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 10:30 a.m.

TIME OUT OF WATER: 11:00 a.m.

WATERWAY DATA: VELOCITY 0.5 f.p.s

VISIBILITY 1.0 foot

DEPTH 15.8 Feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, the concrete of the piers was in good condition with only minor voids due to poor consolidation typically up to 1 inch in diameter with up to ½ inch penetration. Footing exposure was observed around the entire perimeter of Pier 1 with a maximum vertical exposure of 1 foot along the downstream end and the east side of the pier. A tree trunk was observed along the shore side of Pier 1 on top of the footing extending from the upstream nose to the shaft midpoint. The upstream nose of Pier 2 stops at 7 feet below the waterline and then cuts back 1.5 feet. Timber debris has accumulated in this area from channel bottom up 4 feet. There was also one tree trunk that extended to above the waterline along the east side of Pier 2. A scour depression was observed at the upstream end of Pier 3, 3 feet in radius and 1 foot deep.

FURTHER ACTION NEEDED: YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 55520
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Zumbro River

INSPECTION DATE October 24, 2007
NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	15.8'	N	7	N	9	N	7	6	8	8	8	6	7	N	N	N	N	N
	Pier 2	12.1'	N	7	N	9	N	7	8	N	N	7	7	7	N	N	N	N	N
	Pier 3	4.4'	N	7	N	9	N	7	7	8	8	N	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was in good condition with only minor voids due to poor consolidation typically up to 1 inch in diameter with up to ½ inch penetration. Footing exposure was observed around the entire perimeter of Pier 1 with a maximum vertical exposure of 1 foot along the downstream end and the east side of the pier. A tree trunk was observed along the shore side of Pier 1 on top of the footing extending from the upstream nose to the shaft midpoint. The upstream nose of Pier 2 stops at 7 feet below the waterline and then cuts back 1.5 feet. Timber debris has accumulated in this area from channel bottom up 4 feet. There was also one tree trunk that extended to above the waterline along the east side of Pier 2. A scour depression was observed at the upstream end of Pier 3, 3 feet in radius and 1foot deep.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.